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ABSTRACT

Using a Curriculum Characteristics Inventory questionnaire, this study identifies teacher concerns and interests about curriculum materials and discloses teachers' attitudes about the nature and characteristics of curriculum materials. Teachers rated six characteristics in the following order of priority: 1) relevance of subject matter, 2) textbook layout and readability, 3) adaptability of instructional materials to student needs, 4) instructional efficiency, 5) practical usability, and 6) adaptability to teacher innovation. Complete results of the questionnaire are presented in tabular form. (JD)

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What Teachers Want to Know About Curriculum Materials

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Introduction

Curriculum materials are constructed to meet the needs of pupils and major research efforts are devoted to the evaluation of the attainment of curriculum goals. Needs, concerns and priorities of teachers are only rarely introduced into deliberations of curriculum developers.[1, 2] Yet, lacking such considerations the product of the curriculum development is bound to be deficient.[3] Teachers' views are important for, at least, two reasons: a) Teachers may be conceived as reflecting needs of pupils because of their intimate knowledge and experience of the realities of classrooms.[4] b) They play a crucial role in the interpretation and implementation of curricular innovations.[5] These views and concerns of teachers about curriculum may be disclosed by two different approaches. First, teachers may be asked to assess the importance of questions that they may put to curriculum materials. An example of such a question is: "Do the curriculum materials reflect new developments in the particular discipline?" Assigning high importance to this question would reflect high concern of teachers about the subject matter content of materials. Second, one may inquire about teachers' preferences as pertaining to actual curriculum characteristics. For example, the questions whether or not drawings and figures should be incorporated in curriculum materials may be assigned "low importance" by teachers who are not overly concerned with the format of materials. Yet, these same teachers may view drawings and figures as highly desirable characteristics of curriculum materials. A third question about the interaction of teachers and curriculum materials relates to their own image as to their involvement in curriculum implementation. Do teachers conceive themselves as autonomous decision makers who adapt materials to their own classroom situations, or do they expect to implement these materials as faithfully as possible?

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The following questions about views and concerns of teachers in relation to curriculum materials were studied:

1) What questions about curriculum materials concern teachers most?

2) What is the relationship between the importance teachers attach to questions about curriculum materials and their preferences regarding actual curriculum characteristics?

3) What is the image teachers have of their own role in curriculum implementation?

The identification of teachers concerns about curriculum materials and their priorities regarding curriculum characteristics has important practical implications. Knowledge of these concerns and priorities may guide curriculum development as well as the planning of teacher education. At a theoretical level it may provide a framework for research on teachers' roles in the curriculum enterprise and the relationship between teachers and curriculum developers.

Method

Instruments: Two instruments were developed. One consisting of 40 questions that can be put to curriculum materials, is designated as Curriculum Characteristics Inventory (CCI)-Questions. The other, consisting of the same items put in the form of positive statements describing characteristics of curricular materials, is designated as Curriculum Characteristics Inventory (CCI)-Statements. The items were designed in part on the basis of a literature review of existing systems of curriculum analysis such as Eash[6], Stevens and Morrissett[7] and Ben-Peretz[8]. Additional items included in CCI were produced by the investigators on the basis of their experience in curriculum development and teacher education. Content validity of the items was determined by five curriculum experts. CCI consists of 40 items representing the following curriculum characteristics: Subject matter; Book layout; Instruction; Student; Useability; Teacher. For the kind of items representing each of these aspects see Table 3. The respondents were asked a) to rate each item on a six point scale, b) to rank the

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five least important/ desirable items. They were also invited to add items if they so desired.

Sample: Three samples participated in the study, one consisting of secondary biology teachers and the other two non-biology teachers ("others"). The biology teachers (N=70) and one sample of others (N=85) responded to CCI-questions. The third sample (N=90) which was very similar in composition to the second, responded to CCI-Statements. Table 1 shows the composition of each sample across several background variables.

Insert Table 1 here

Although the samples are not random they do represent a substantial portion of Israeli teachers with similar backgrounds. The biology teachers are different from the other two samples in several important characteristics. The percentage of male biology teachers is almost equal to the percentage of female teachers, they hold higher academic degrees and were trained as teachers in Universities. Moreover, all the biology teachers have been teaching new inquiry oriented biology programs with a strong emphasis on laboratory investigations and many of them, at least those with more than eight years of teaching, experienced within their own teaching career a transition from a traditionally oriented program to a new, different one. The general atmosphere in Israeli schools is highly conducive to curriculum reforms and consequently the questionnaires used in the present study are well within the interest of most teachers.

Data Analysis: Two modes of responses were requested a) rating of each item on a six point scale in which 1 = not important and 6 = very important, b) ranking of the most important and 5 least important items. The rating results are reported both as frequency distributions and as

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mean scores and standard deviations on a 6 point scale. The ranking results are reported as mean ranking scores.
Since there were 40 items the top item received rank of 40, the next 39 and so on till 35, while the bottom received ranking from 1 to 5. The rest 30 items of each respondent received ranking of 19.5 each. The date was analyzed by SPSS computer programs yielding frequency distributions, means standard deviations, correlations, t tests and one way analysis of variance.

Findings

General views of teachers.

Two independent samples, one comprised of secondary school biology teachers and the other comprised of elementary and secondary teachers of other subjects, responded to the Questions part of the Curriculum Characteristics Inventory (CCI). Table 2 represents the results of the two samples.

Insert Table 2 here

The subtests, each representing a particular aspect, are arranged in Table 2 from highest to lowest according to the ratings (Part A) of the secondary school biology teachers as follows: Subject matter, Instruction, Book Layout, Student, Useability and Teacher. The same sequence with one exception is found in the "others" group, for which the "Student" subtest is second and the "Instruction" subtest is fourth. Generally, there is complete congruence between the rating (Part A) and ranking (Part B) in both samples with one exception: in the "others" group, in Part B, the "Student" subtest occupies the top position. It may be concluded that questions related to subject matter are most important for all teachers, while questions related to students are equally important for non-biology teachers but not so important to biology teachers. Interestingly for both samples both rating and ranking show that questions related to the teacher are conceived as the least important.

Since in most items the mean scores of the two samples were similar, the two samples were combined thereby representing the views of Israeli teachers in general (see Table 3).

Insert Table 3 here

The responses in Table 3 are arranged according to the mean rating and ranking scores from highest to lowest within each subtest.

Differences between biology and non-biology teachers.

A preliminary comparison of the elementary (N=40) and secondary (N=45) non-biology teachers revealed very similar results. Since the biology teachers sere secondary schoool teachers, only the secondary non-biology teachers were included in the comparison. Table 2 represents the subtests and items for which statistically significant differences were found.

Insert Table 4 here

Table 4 shows that a major difference between the two groups related to items dealing with various aspects of the "Student" such as age and opportunities to develop creativity, attitudes and values. Biology teachers appear to be significantly less concerned with these issues. While concerns related to the teacher occupy the lowest priority in both groups, biology teachers appear to be less concerned than their non-biology counterparts about issues such as whether or not the authors' background or authors' reasons for curricular decisions, or the time required for teachers' preparation are specified. On the other hand, biology teachers express a higher level of interest in suggestions for homework. They are also considerably more interested in "Book Layout" and especially in the quality and adequacy of the illustrations. Lastly, with regard to "Useability", non-biology teachers are more interested

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to ascertain that the necessary instructional means will be readily available.

As may be seen in Table 3, five items were considered only by the biology teachers. These items are science oriented with special interest to biology. It is interesting to note the extremely high priority assigned to the role of the laroratory and the very high interest in the role of field work, as well as the emphasis on the acquisition of inquiry skills. These expressed interests certainly reflect the inquiry orientation of the Israeli high school biology curriculum.

Whether or not the program contains experiments with living animals or requires prerequisite knowledge of chemistry and physics appear to be of considerably less concern to the biology teachers.

Interrelationships among different areas of concern

Table 5 represents the intercorrelations among the subtest scores.

Insert Table 5 here

It may be observed that for both groups a concern for one area is, with few exceptions, moderately associated with concern with other areas. This means that some teachers are more interested than others in knowing about the programs that they are going to teach. For both groups however, a high concern for "Subject matter" is not associated with a high concern for issues related either to the "Teacher" or to the "Book layout".

Congruence between rating and ranking

The relationships between Part A (rating) and Part B (ranking) were examined by computing the correlations between a) the responses to the same subtests in the two parts, and b) the responses to all items of Part A with those to all items in Part B. Statisticaly significant correlations between Parts A and B were found for the biology teachers (N=70) in the following subtests:

Subject matter (.46), Layout (.42), Student (.45) and Useability (.38), all significant differences beyond the 0.01 level. For the non-biology teachers (N=85) there were statistically differences beyond the 0.01 level in subtests Subject Matter (.32) and Book Layout (.51). Statistically differences beyond the 0.05 level were found for subtests Instruction (.20)

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and Useability (.22).

When individual items intercorrelations are considered we find for the biology teachers a mean correlation index of .39 with a lowest value (.14) for item 35 and a highest value (.57) for item 26. For the non-biology teachers the mean correlation index was .27 with a lowest level (.11) for item 22 and a highest level (.49) for item 29. It may be concluded that while the rating and ranking are slightly or moderately correlated, they are not identical and, therefore, when information gathered by both points at similar trends it may be regarded with a high level of confidence.

Relationship of responses to background variables

In each of the samples, i.e. biology and non-biology teachers, one way analysis of variance was performed to detect differences among groups with different backgrounds. In both samples there were no statistically significant differences according to sex, education, teaching experience and type of school.

Within the non-biology teachers there were 9 geography teachers who differed from the rest in two subtests. Their mean score in subtest "Instruction" was 3.33 as opposed to that of other non-biology teachers 4.53 ($F=3.64$, $p<0.01$) and in subtest "Student" 4.00 as opposed to that of other non-biology teachers 5.00 ($F=3.18$, $p<0.02$). Among the biology teachers there was one statistically significant difference in subtest "Useability" in which the mean of teachers in grades 7-8 (N=6) was 4.96 and that of teachers in other grades was significantly lower 4.16 ($F=7.27$, $p<0.001$).

Questions versus Statements

The items which comprised CCI were formulated either as questions or as statements. For example: item 23 reads as a question: "Are there opportunities to develop creativity?". As a statement it reads: "There are opportunities to develop creativity".

As stated above two samples of non-biology teachers responded each either to CCI-Questions or to CCI-Statements. The two samples were very similar in all background variables.

The results obtained with CCI-Statements were generally very similar to those reported for CCI-Questions, both in mean scores

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and in the intercorrelations among subtests in Parts A and B.

Insert Table 6 here

Thus there were altogether no statistically significant differences in the mean scores of three subtests. These statistically significant differences which occured are presented in Table 6.

Table 6 shows that most of the statistically significant differences found were in the rating of items in subtest "Student" and in the rnking of items in subtest "Teacher". Since the results generally lend support to the assumption about the similarity of the two samples, we consider the few differences reported in Table 6 as representing the effect of item format, rather than differences between samples. As may be seen in subtests "Subject matter" and "Student", higher values were obtained in CCI-Questions while with one exception, the opposite was the case for subtest "Teacher", where higher values appear in CCI-Statements.

Discussion

Three questions were dealt with in the study and each will be discussed separately.

1) What questions about curriculum materials concern teachers most? The three samples participating in the study above showed the highest level of concern for the "Subject Matter" aspect of curriculum materials. On the other hand, questions related to the "Teacher" were concerned as least important.

The high priority all teachers accord to "Subject Matter" is consistent with findings of studies dealing with teacher planning[9, 10] showing that teachers spend the largest proportion of their planning on content decisions. The centrality of content in teachers' planning deliberations is reflected in the importance they attach to questions about curriculum materials related to this area. On the other hand it appears as if teachers are reluctant to ask questions focused on the "Teacher" aspect. One possible explanation for these findings is that teachers expect curriculum materials to focus on content and/or students and accept this as a legitimate and defensible orientation. On the other hand they do not expect curriculum materials to deal with the mode of interaction between themselves and the materials.

findings of studies related to teachers' implicit theories[11]. In one of these studies[12] it was found that aides and parents were much more salient in the teachers' thinking than were other teachers and the principal. One may conclude either that teachers tend to assign considerations about their own profession a minor place in their professional deliberations, or alternatively, one may argue that teachers do not give priority to questions concerning their interaction with curriculum materials because they assume the role and stance of decision maker. In that case teachers will any way make the decisions they consider appropriate to circumstances of their classroom, so it is of no great significance whether the curriculum materials provide them with alternative options nor does the teacher guide seem very important. Further research is needed to ascertain which of these interpretations matches reality. Such research is especially important in the light of the findings of the Rand Study[13] on the impact of teachers' sense of efficacy namely, their attitudes about their professional competence, on their success in implementing innovative curricula.

If we look at the ranking order of specific items, and focus on the most and least desirable and/or important, an interesting picture emerges. In subtest "Subject matter" the highest ranking goes to emphasis on principles and concepts of the discipline and the lowest to prerequisite knowledge in other disciplines. This result may be a reflection of teachers' acceptance of the "structure of knowledge" doctrine on the one hand, and their apparent inclination to disregard previous learning experiences of their students on the other hand. In subtest "Student" the highest ranking has been assigned to the adaptability of curriculum materials to students of different ability levels, and the lowest to the specification of the target population. In other words, the question whether the material is potentially adaptable to a range of ability levels is considerably more important than the question whether the developers have designated the materials to a

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specific target population. It seems that teachers are well aware of their intimate knowledge of classroom realities and students' needs and are therefore interested in flexible curriculum materials. The leading item in subtest "Instruction" is related to laboratory work, for biology teachers, and to the use of additional information sources by students themselves as far as non-biology teachers are concerned. Apparently teachers are highly interested in materials which provide for individualization and experiences in which students are actively involved. This preference ties very nicely with the high priority assigned to the flexibility of curricular materials. The lowest ranking assigned to the specification of detailed objectives is congruent with similar findings which indicate that teachers think in terms of contents and students activities, rather than in terms of objectives [9, 10, 11]. In the "Teacher" subtest the highest ranking has been assigned to teachers' autonomy to choose and initiate teaching strategies. This finding supports the interpretation that the low postion assigned to subtest "Teacher" is a result of teachers' self confidence in their ability to handle the materials without lockstep directions of the curriculum developers. Their low interest in the developers' background may be another indication of their readiness to assume the role of 'user-developers' who are responsible for the translation of externally developed materials into classroom use through a process of choice and instructional planning[4]. In subtest "Useability" availability of instructional means is obviously a question of great importance. The low concern of teachers as to whether or not the materials are required by school authorities may serve as indication of the relatively wide range of freedom that Israeli teachers have in selecting their curriculum materials.

Of all background variables analyzed, only the nature of discipline taught was found to show statistically significant differences. Some interesting differences between biology teachers and non-biology teachers disclosed in the study have already been discussed. The lesser emphasis of biology teachers on questions related to the "Student" aspect of

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curriculum materials can be accounted for by their higher academic orientation. It may be that secondary biology teachers view themselves more as "representatives" of the science of Biology whereas the other teachers tend to view themselves as educators, oriented toward the teaching of children. Corraboration of this interpretation may be found in a study[14] comparing the priorities of secondary teachers and elementary teachers in regard to educational goals. It was found that secondary teachers tended to attach higher priority to intellectual achievements whereas elementary teachers considered social integration as a more important goal. That biology teachers are more concerned with "book layout" may be due to the significant role illustrations have in Biology.

The finding that biology teachers were less concerned than others to ascertain that the necessary instructional means and services will be readily available may be a reflection of the fact that instructional means and services are made available to biology teachers more than to other groups of teachers.[15] The inquiry orientation of high school biology teachers has already been discussed.

2) What is the relationship between the importance teachers attach to questions about curriculum materials and their preferences as to actual curriculum characteristics?

As stated above statistically significant differences were found only in rating of items in subtest "Subject Matter" and "Student" and in ranking of items in subtest "Teacher". These differences, reported in Table 6, are considered as representing the effect of item format, rather than differences between samples. In subtests "Subject matter" and "Student" higher values were obtained in CCI-Questions, while with one exception the opposite was the case for subtest "Teacher". It appears as if teachers are reluctant to ask questions related to their own role in the curriculum, although they do conceive themselves as playing an important role. On the other hand, it is apparently desirable to know what kind of opportunities the curriculum offers to students, but it is not so important whether or not such opportunities

are actually included in the curriculum. The only exception is the item "Can the teacher use the curriculum materials without special training". Here the social desirability of the question is relatively high, since it implies that "if special training is necessary I am ready for it". On the other hand to say that it is important that teachers can use the curriculum without special training implies that "I do not want to spend my time in such training", which is much less acceptable in the educational community.

It would be interesting to follow up in further studies whether teachers' apparent concern for question about the "Student" aspect of curriculum materials stems from the social desirability of these questions and is not accompanied by a similar high preference of curriculum characteristics related to the "Student". The significant statistical differences in items in subtest "Teacher" are specially intriguing. Teachers' disinclination to give high priority to questions concerning their own role, while ranking significantly higher statements about curriculum characteristics pertaining to teachers, seems to point to a need for raising teachers' awareness to the existence of a possible ambivalence in their attitudes about teachers' role in curriculum implementation.

3) What is the image teachers have as to their own role in curriculum implementation?

This question was partly answered in the discussion of the other two problems treated in this study. It seems that too little is known, as yet, about the views of teachers about this important issue. Teachers do not assign high priority to question related to the "Teacher" aspect of curriculum materials, but we lack additional evidence that would provide us with insights into the causes for this phenomenon. It may be that teachers receive conflicting messages from the educational establishment and the scholarly community as regards expectations about their role in curriculum implementation. The apparent ambivalence in teachers' views calls for further investigations that could clarify

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this issue. In the light of growing awareness that active involvement of teachers as change agents, who mold curriculum materials according to their specific situations is crucial for the successful introduction of innovations into the educational system, it seems that teachers' image of their role in curriculum implementation should become a focus of inquiry.

The present study was not conducted in relation to specified sets of curriculum materials. The findings about biology teachers reported in this study may be interpreted as related to the wide-use of B.S.C.S. materials [15]. An interesting avenue of investigation would be to find out whether the nature of curriculum materials does indeed influence the choices of teachers as to the importance of questions that can be put to the materials, or to their preferences about curriculum characteristics. Knowledge about possible inter-relations between teachers views and the nature of curriculum materials could provide valuable background information for curriculum developers.

Table 1: Characteristics of the three samples (Distribution in percents)

Background variable		Biology Secondary N=70 CCI - Questions	Others N=85 CCI - Questions	Others Secondary N=45 CCI - Questions	Others N=90 CCI - Statements
Sex	Male	45	6		19
	Female	55	94	91	81
Discipline:					
	General (elementary)	--	30	--	26
	Hebrew	--	29	48	22
	Mathematics	--	22	32	29
	Foreign Language	--	12	11	15
	Geography	--	7	9	8
	Biology	100	--	--	--
Grade Level					
	1-2	--	14	--	9
	3-6	--	33	--	27
	7-10	27	33	62	28
	11-12	73	20	38	36
Academic Degree					
	None	10	48	18	46
	B.A.	56	45	68	43
	M.A.	34	7	14	11
Teacher Training					
	None	--	41	18	36
	Teachers College	17	59	82	64
	University	83	--	--	--
Years of Teaching Experience					
	1 - 3	24	17	18	14
	4 - 7	28	20	18	11
	8 -15	20	30	31	32
	> 16	28	33	33	43

Table 2: Mean scores on the two parts of the CCI-Questions

Subtest	Part A *				Part B **			
	Biology (N=70)		Others (N=85)		Biology (N=70)		Others (N=85)	
	x	S.D.	x	S.D.	x	S.D.	x	S.D.
Subject matter	5.10	.43	5.26	.73	24.06	3.26	22.23	4.63
Book layout	4.97	1.03	4.78	1.22	21.06	6.33	19.68	5.71
Instruction	4.55	.58	4.65	.71	20.03	2.25	20.41	3.69
Student	4.48	.66	5.10	.61	21.05	3.09	23.37	3.11
Useability	4.27	.74	4.40	.87	19.58	3.92	17.88	4.65
Teacher	4.01	.70	4.21	.73	17.91	2.22	17.65	2.06
Total:	4.47	.47	4.65	.56	20.36	2.10	21.34	2.00

* Rating - Highest possible score = 6

** Ranking - Mean rank on a 40-point scale

Table 3: Mean response scores on individual items of CCI-Questions (N = 155)

	Subtests and Items	Part A x	Part A S.D.	Part B x	Part B S.D.
	Subject Matter	5.10	.80	23.88	4.82
2.	Are principles and concepts of the discipline emphasized?	5.50	.85	25.97	10.10
1.	Is the content up-to-date?	5.49	.77	26.61	10.07
11.	Do the curriculum materials reflect new developments in the particular discipline?	5.21	.94	2.21	6.80
* 10.	Do the curriculum materials require out-doors nature study?	5.07	.80	24.84	8.02
* 25.	Do the curriculum materials stress the development of inquiry skills?	5.06	1.08	21.99	8.85
6.	Do the curriculum materials provide a broad knowledge of subject matter?	4.96	1.02	23.15	8.58
* 20.	Do the curriculum materials require prior knowledge of chemistry and physics?	4.44	1.16	20.03	5.03
	Book Layout	4.82	1.20	20.64	6.17
33.	Are the print and general layout attractive?	5.06	1.15	20.92	7.63
32.	Are the materials well-illustrated?	4.67	1.40	20.36	6.96
	Student	4.75	.80	22.77	3.54
19.	Can the curriculum materials be adapted to students of different ability levels?	5.25	.99	24.48	9.82
23.	Are there opportunities to develop creativity?	5.24	.93	25.11	8.89
28.	Are there opportunities for value education?	5.14	1.04	24.83	9.32
22.	Is the subject matter applicable and relevant to life outside school?	5.11	1.11	24.38	9.39
24.	Are there opportunities to express feelings and attitudes?	5.06	1.10	23.64	8.24
16.	Is the age of the target student population specified?	4.46	1.46	20.55	6.43
40.	Are there opportunities to educate for national values?	4.31	1.68	20.33	9.33
36.	Is the level of the target student population specified?	3.99	1.41	18.68	5.33

Table 3

Subtests and Items	Part A x	Part A S.D.	Part B x	Part B S.D.
Instruction	4.54	.76	20.59	3.33
* 5. Do the curriculum materials require work in the Laboratory?	5.51	.78	25.21	8.93
37. Are students directed to additional information sources?	5.09	1.03	21.70	6.66
9. Does the sequence provide for increased difficulty level?	5.07	1.06	22.34	7.88
88. Is the language difficult?	4.82	1.23	21.00	9.06
21. Are innovative instructional Strategies required?	4.51	1.10	20.25	6.92
* 15. Are experiments with living animals included?	4.29	1.32	19.03	5.72
17. Do curriculum materials require group work?	3.71	1.32	17.60	7.39
27. Do the curriculum materials specify detailed students' outcomes?	3.41	1.33	15.93	7.26
Useability	4.27	.90	18.92	4.42
18. Are the necessary instructional means readily available?	5.40	.90	24.50	8.58
3. Do the curriculum materials allow for transfer from one school to another?	4.12	1.36	18.83	10.93
29. What is the price of the student textbook?	3.97	1.62	15.46	8.22
4. Are the curriculum materials designed as an enrichment program or are they required by the educational authorities?	3.82	1.33	16.86	7.17
Teacher	4.11	.80	18.17	2.41
38. Is the teacher free to choose and initiate teaching strategies?	5.32	.92	24.54	8.14
13. Do the curriculum materials provide the teacher with alternatives for choice?	5.09	.97	22.04	7.14
7. Do the curriculum materials include a teacher guide?	4.86	1.28	21.69	7.78
34. Can the teacher utilize the curriculum materials without special training?	4.66	1.26	19.94	5.33
39. Do the materials contain suggestions for homework?	4.20	1.36	17.56	7.63

Table 3:

Subtests and Items	Part A x	Part A S.D.	Part B x	Part B S.D.
14. Do the curriculum materials provide ready-made tests?	4.03	1.42	19.50	7.39
31. Does the teacher guide explain the considerations of the curriculum developers?	3.92	1.48	17.82	7.64
30. Is the teacher required to devote a lot of time for preparation?	3.86	1.48	16.56	7.43
26. Does the teacher guide include explicit educational objectives?	3.83	1.57	17.21	7.28
12. Is the time necessary for instruction specified in the teacher's guide?	3.43	1.45	13.83	8.53
35. Is background information about curriculum developers made available to teachers?	2.56	1.43	9.15	8.60

* Responses to these items were obtained only by biology teachers (N=70)

Table 4: Statistically significant differences between biology (N=70) and non-biology (N=45) secondary teachers

		Biology		Others			Biology		Others		
Subtest	Items	x	S.D.	x	S.D.	t	x	S.D.	x	S.D.	t
Subject matter	whole	5.10	.48	5.40	.66	-2.64**					
	1						29.16	9.79	24.71	9.23	-2.43*
	11	4.98	.98	5.54	.82	-3.15					
Layout	whole	4.97	1.03	4.54	1.28	1.97*					
	32	5.00	1.11	4.09	1.64	3.28**					
Instruction	whole										
	8	5.12	1.18	4.49	1.41	2.57*					
	9	4.78	1.14	5.24	1.02	-2.20*					
Student	whole	4.48	.66	5.06	.48	-5.08					
	16	3.87	1.45	5.04	1.10	-4.59**	18.86	6.18	22.47	7.45	-2.82**
	23	4.94	.95	5.49	.77	-3.19**	23.37	8.42	27.80	8.87	-2.70*
	24	4.68	1.14	5.25	1.06	-2.65**	20.29	6.26	25.18	8.25	-3.40**
	28	4.60	1.17	5.59	.58	-5.99**	22.23	8.29	27.64	9.09	-3.29**
	40	3.38	1.58	5.04	1.12	-6.09**	15.42	8.34	24.89	8.81	-5.55**
Useability	whole										
	3	3.81	1.13	4.47	1.56	-2.42*	20.89	6.31	23.67	8.18	-2.05
	18						26.84	9.16	22.47	7.90	2.64
Teacher	whole										
	30	3.47	1.43	4.09	1.50	-2.21*					
	31						16.44	7.40	19.20	7.42	-1.95*
	35	2.19	1.16	2.84	1.62	-2.54*					
	39	4.39	1.22	3.40	1.57	3.00**					

*$p < 0.05$

**$p < 0.01$

Table 5: Intercorrelation among subtests (Part A)

Subtest	1.		2.		3.		4.		5.	
	Biology	Others	Biology	Others	Biology	Others	Biology	Others	Biology	Others
1. Subject matter	--	--								
2. Instruction	.58	.33	--	--						
3. Teacher	.19	.26	.57	.62	--	--				
4. Book Layout	.03	.10	.20	.41	.53	.46	--	--		
5. Student	.32	.37	.59	.46	.55	.51	.20	.36	--	--
6. Useability	.33	.23	.42	.49	.39	.61	.20	.27	.28	.36

Correlation indices statistically significant at 0.05 level are 0.23 for biology (N=70) and 0.20 for others (N=85).

Table 6: Statistically significant differences between CCI-Questions (N=85) and CCI-Statements (N=90)

Subtest	Items	Questions		Statements		t	Questions		Statements		t
		x	S.D.	x	S.D.		x	S.D.	x	S.D.	
Subject matter	whole	5.26	.73	4.36	.63		22.43	4.63	19.27	4.39	
	6	5.02	1.11	4.51	1.09	2.27					
	11	5.40	.87	5.06	1.10	2.22*					
Student	whole	5.10	.61	4.70	.90		23.37	3.11	22.74	3.94	
	23	5.49	.85	4.88	1.46	3.37**					
	24	5.38	.96	4.80	1.42	3.09**					
	28	5.60	.62	4.95	1.34	4.09**					
	36	4.95	1.28	3.98	1.58	4.40**					
	40	5.08	1.08	4.65	1.56	2.12**					
Teacher	whole	4.21	.73	4.26	.73		17.65	2.06	19.01	2.01	
	7						21.06	8.34	28.85	8.38	-2.20*
	12						14.34	8.05	17.46	8.29	-2.52*
	14						15.49	7.51	18.18	8.10	-2.25*
	31						18.41	7.31	20.40	4.84	-2.11
	34	4.59	1.35	3.79	1.64	3.49**	19.34	5.32	15.66	7.98	3.58**
	35	2.87	1.57	3.57	1.50	-2.97**	9.51	8.66	16.50	6.79	-5.90**
	39						15.87	7.88	19.21	7.4	-2.87

* $p < 0.05$ ** $p < 0.01$

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